



BSS127

N-CHANNEL ENHANCEMENT MODE FIELD MOSFET

Product Summary

BV _{DSS}	R _{DS(ON)}	Package	I _D T _A = +25°C
600V	160Ω @ V _{GS} = 10V	SC59 SOT23	70mA

Description

This new generation uses advanced planar technology MOSFET, provide excellent high voltage and fast switching, making it ideal for small-signal and level shift applications.

Applications

- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

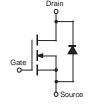
Features

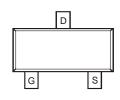
- Low Input Capacitance
- High BV_{DSS} Rating for Power Application
- Low Input/Output Leakage
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

Mechanical Data

- Case: SC59 / SOT23
- Case Material: Molded Plastic "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Annealed over Copper Leadframe Solderable per MIL-STD-202, Method 208 (3)
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)







Top View

Equivalent Circuit

Top View

Ordering Information (Note 4)

Part Number	Case	Packaging
BSS127SSN-7	SC59	3000/Tape & Reel
BSS127S-7	SOT23	3000/Tape & Reel

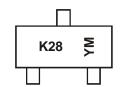
Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
- 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
- 4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

SOT23

K29 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: D = 2016) M = Month (ex: 9 = September)



K28 = Product Type Marking Code

SC59

YM = Date Code Marking Y = Year (ex: D = 2016)

M = Month (ex: 9 = September)

Date Code Key

Year	201	3	2014		2015	20	16	2017		2018	2	2019
Code	A		В		С		D	E		F		G
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



Characteristic	Symbol	Value	Unit		
Drain-Source Voltage	V _{DSS}	600	V		
Gate-Source Voltage	V _{GSS}	±20	V		
Continuous Drain Current (Note 5) V _{GS} = 10V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	50 40	mA
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	70 55	mA
Continuous Drain Current (Note 5) V _{GS} = 5V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	45 35	mA
Continuous Drain Current (Note 6) V _{GS} = 5V	Steady State	$T_A = +25^{\circ}C$ $T_A = +70^{\circ}C$	I _D	65 50	mA
Pulsed Drain Current @ T _{SP} = +25°C (Note 7)	•	•	I _{DM}	0.16	А

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation, @T _A = +25°C (Note 5)	P_{D}	0.61	W
Thermal Resistance, Junction to Ambient @ T _A = +25°C (Note 5)	$R_{ heta JA}$	204	°C/W
Power Dissipation, @T _A = +25°C (Note 6)	P_{D}	1.25	W
Thermal Resistance, Junction to Ambient @ T _A = +25°C (Note 6)	R _{0JA}	100	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

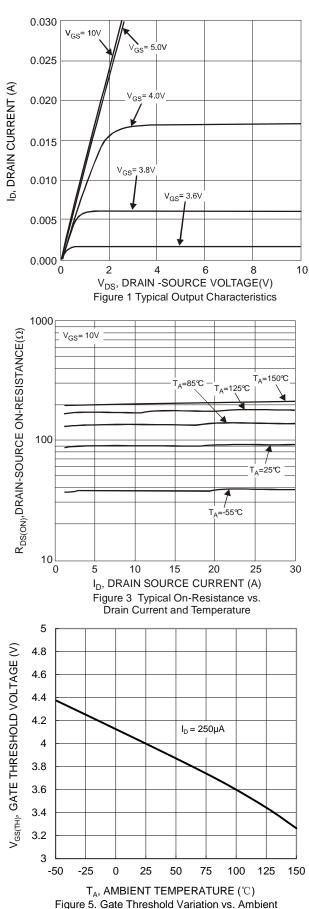
Electrical Characteristics (@ $T_A = \pm 25$ °C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS (Note 8)							
Drain-Source Breakdown Voltage	BV _{DSS}	600	_	_	V	$V_{GS} = 0V, I_D = 250\mu A$	
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	_	_	0.1	μΑ	V _{DS} = 600V, V _{GS} = 0V	
Gate-Body Leakage	I _{GSS}	_	_	±100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
ON CHARACTERISTICS (Note 8)							
Gate Threshold Voltage	V _{GS(TH)}	3	_	4.5	V	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	
Static Drain-Source On-Resistance		_	80	160	Ω	$V_{GS} = 10V, I_D = 16mA$	
Static Dialii-Source Off-Resistance	R _{DS(ON)}	_	95	190	12	$V_{GS} = 5.0V, I_D = 16mA$	
Forward Transfer Admittance	Y _{fs}	_	76	_	mS	$V_{DS} = 10V, I_D = 16mA$	
Diode Forward Voltage	V_{SD}	_	_	1.5	V	$V_{GS} = 0V, I_{S} = 16mA$	
DYNAMIC CHARACTERISTICS (Note 9)							
Input Capacitance	C _{iss}	_	21.8	_			
Output Capacitance	Coss	_	2.2	_	pF	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz$	
Reverse Transfer Capacitance	C _{rss}	_	0.3	_			
Total Gate Charge	Qg	_	1.08	_		101/1/	
Gate-Source Charge	Q _{gs}	_	0.08	_	nC	$V_{GS} = 10V, V_{DD} = 300V,$	
Gate-Drain Charge	Q_{gd}	_	0.50	_		$I_D = 0.01A$	
Turn-On Delay Time	t _{D(ON)}	_	5.0	_	ns	.,	
Turn-On Rise Time	t _R	_	7.2	_	ns	$V_{DD} = 300V, V_{GS} = 10V,$	
Turn-Off Delay Time	t _{D(OFF)}	_	28.7	_	ns	$R_{GEN} = 6\Omega$	
Turn-Off Fall Time	t _F	_	168	_	ns	$I_D = 10$ mA	
Reverse Recovery Time	t _{RR}	_	131	_	ns	V _R =300V, I _F =0.016A,	
Reverse Recovery Charge	Q _{RR}	_	32	_	nC	di/dt = 100A/µs	

Notes:

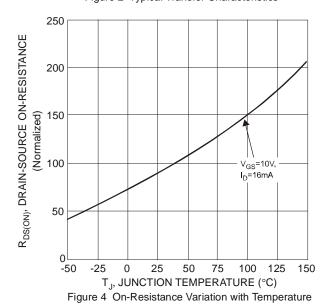
- 5. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided.
- Device mounted on 1"x 1" FR-4 PCB with high coverage 2 oz. Copper, single sided.
 Repetitive rating, pulse width limited by junction temperature, 10µs pulse, duty cycle = 1%.
 Short duration pulse test used to minimize self-heating effect.
 Guaranteed by design. Not subject to production testing.





Temperature

100 $(Y_{DS}=10V)$ $T_{A}=125^{\circ}C$ $T_{A}=25^{\circ}C$ $T_{A}=25^{\circ}C$ $T_{A}=-55^{\circ}C$ $V_{GS}, GATE SOURCE VOLTAGE(V)$ Figure 2 Typical Transfer Characteristics



T_A= 150°C

T_A= 150°C

T_A= 25°C

T_A= 25°C

T_A= -55°C

T_A= -55°C

T_A= -50°C

T_A= -



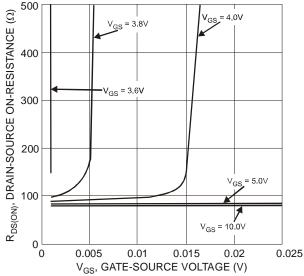
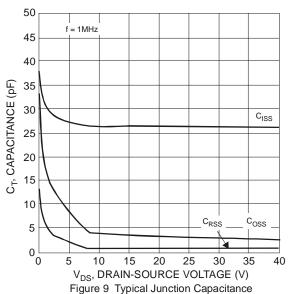


Figure 7 Typical On-Resistance vs. Drain Current and Gate Voltage



200 $R_{DS(ON)}$, DRAIN-SOURCE ON-RESISTANCE (Ω) $R_{DS(ON)}(\Omega)$ Ave @ $I_D = 20$ mA 180 160 140 120 100 80 60 40 20 0 2 10 V_{GS} , GATE-SOURCE VOLTAGE (V) Figure 8 Typical Transfer Characteristic

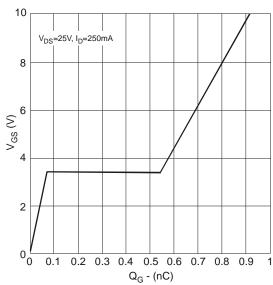
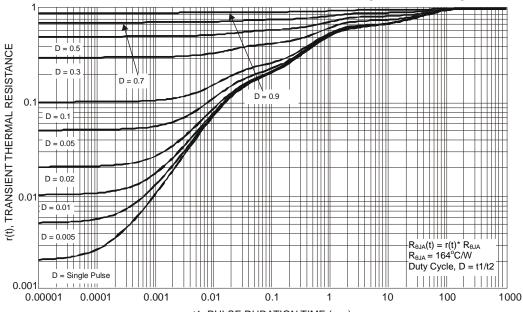


Figure 10 Gate Charge Characteristics



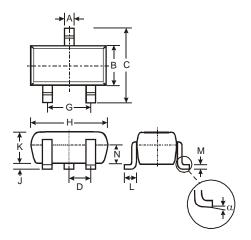
t1, PULSE DURATION TIME (sec)
Figure 11 Transient Thermal Resistance



Package Outline Dimensions

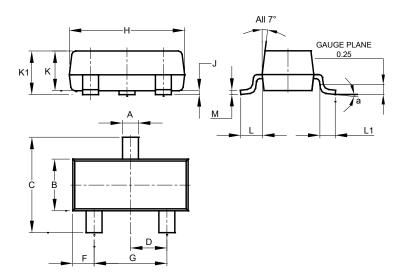
Please see http://www.diodes.com/package-outlines.html for the latest version.

SC59



SC59					
Dim	Min	Max	Тур		
Α	0.35	0.50	0.38		
В	1.50	1.70	1.60		
C	2.70	3.00	2.80		
D	-	-	0.95		
G	-	ï	1.90		
H	2.90	3.10	3.00		
J	0.013	0.10	0.05		
K	1.00	1.30	1.10		
L	0.35	0.55	0.40		
M	0.10	0.20	0.15		
N	0.70	0.80	0.75		
α	0°	8°	-		
All	Dimens	ions in	mm		

SOT23

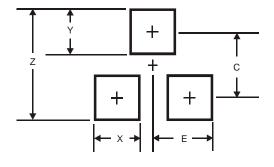


	SOT23					
Dim	Min	Max	Тур			
Α	0.37	0.51	0.40			
В	1.20	1.40	1.30			
С	2.30	2.50	2.40			
D	0.89	1.03	0.915			
F	0.45	0.60	0.535			
G	1.78	2.05	1.83			
Н	2.80	3.00	2.90			
7	0.013	0.10	0.05			
K	0.890	1.00	0.975			
K1	0.903	1.10	1.025			
L	0.45	0.61	0.55			
L1	0.25	0.55	0.40			
М	0.085	0.150	0.110			
а	0°	8°				
All	All Dimensions in mm					

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SC59



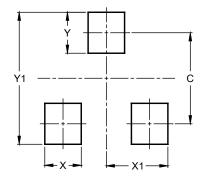
Dimensions	Value (in mm)
Z	3.4
Х	0.8
Y	1.0
С	2.4
E	1.35



Suggested Pad Layout (cont.)

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT23



Dimensions	Value (in mm)
С	2.0
Х	0.8
X1	1.35
Υ	0.9
Y1	2.9

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